

What is claimed is:

1. An apparatus comprising:
an array of micromechanical optical modulators;
an electronic control system for operating the optical modulators in accordance with a received video signal; and
an overlayer for the array of modulators to modify the fill factor for incident light on the array of modulators, the incident light corresponding to at least one color constituent of a video signal.
2. The apparatus of Claim 1, wherein the overlayer comprises an array of optical elements proximate the array of optical modulators, and positioned such that each optical element of the array directs incident light on a respective one of the optical modulators of the array.
3. The apparatus of Claim 2, wherein the optical elements comprise plano-convex micro-lenses formed on a transparent sheet.
4. The apparatus of Claim 1, wherein each optical modulator of the array has an optical section and a mechanical section and wherein the overlayer directs incident light on a respective optical section and reduces incident light on the corresponding mechanical section.
5. The apparatus of Claim 3, wherein the overlayer focuses the light at a location proximate the respective optical section.
6. The apparatus of Claim 1, further comprising a post to position the overlayer at a fixed distance from the array of micromechanical optical modulators.
7. An apparatus comprising:
a substrate having an array of through holes, the through holes being transparent to visible light;

an array of micromechanical optical modulators on the substrate, each optical modulator being proximate a respective one of the through holes, each modulator having a first position to allow incident visible light to pass through the respective through hole and a second position to prevent incident visible light from passing through the respective through hole, the incident light corresponding to at least one color constituent of a video signal; and

an electronic control system for operating the optical modulators in accordance with a received video signal.

8. The apparatus of Claim 7, wherein each optical modulator comprises a transparent portion and an opaque portion and wherein the incident light is incident on the transparent portion in the first position and the incident light is incident on the opaque portion in the second position.

9. The apparatus of Claim 7, wherein each optical modulator comprises an opaque portion and wherein the incident light is not incident on the optical modulator in the first position and the incident light is incident on the opaque portion in the second position.

10. The apparatus of Claim 9, wherein the opaque portion is reflective.

11. The apparatus of Claim 7, further comprising an optical overlayer proximate the array of optical modulators to direct incident light to a respective one of the through holes.

12. The apparatus of Claim 7, wherein the optical overlayer comprises an array of micro-lenses.

13. An apparatus comprising:

an array of active surfaces, each having a first portion corresponding to an ON state and a second portion corresponding to an OFF state; and

an array of electromechanical actuators, each corresponding to one of the active surfaces, to translate the active surface to alternately expose the first portion or the second portion to incident visible light.

14. The apparatus of Claim 13, wherein the first portion comprises a substantially flat reflective surface to reflect incident light back in the direction from which it came.

15. The apparatus of Claim 13, wherein the second portion comprises an angled mirrored surface to reflect incident light away from the direction from which it came.

16. The apparatus of Claim 13, wherein at least one of the first surface and the second surface comprise a polarization-altering element.

17. The apparatus of Claim 13, wherein at least one of the first surface and the second surface comprise a powered optical element.

18. The apparatus of Claim 13, further comprising a substrate having an array of through holes, each through hole being proximate a respective active surface, the through holes being transparent to visible light, and wherein one of either the first or second portions of the active surface is transparent to visible light to allow the incident light to pass through the respective through hole.

19. The apparatus of Claim 13, further comprising an optical overlayer proximate the array of active surface to direct incident light to the active surfaces.

20. An apparatus comprising:
a substrate having a first array of active surfaces corresponding to one of an ON state or an OFF state with respect to incident visible light;

a second array of active surfaces, each active surface corresponding to an active surface of the first array, the surfaces of the second array corresponding to the other of either an ON state or an OFF state with respect to incident visible light; and

an array of electromechanical actuators, each corresponding to a surface of the second array, to move the surfaces of the second array to alternately cover or uncover an active surface of the second array, the incident light striking a surface of the first array when the surface of the first array is uncovered and the incident light striking a surface of the second array when the surface of the first array is covered.

21. The apparatus of Claim 20, wherein the surfaces of the first array of active surfaces are reflective in one direction and wherein the surfaces of the second array are reflective in another direction.

22. The apparatus of Claim 20, wherein the surfaces of the first array are reflective and the surfaces of the second array are transmissive.

23. The apparatus of Claim 20, wherein the active surfaces of the first array comprise through holes through the substrate, each through hole being proximate a respective surface of the second array, the through holes being transparent to visible light, and surfaces of the second array alternately cover or uncover a respective through hole to allow the incident light to pass through the respective through hole.

24. The apparatus of Claim 20, wherein the surfaces of the second array are reflective surfaces and correspond to an ON state and wherein the through holes correspond to an OFF state.

25. The apparatus of Claim 20, wherein the actuators each correspond to a surface of the second array, for translating the surfaces to alternately cover or uncover the surfaces of the first array.

26. The apparatus of Claim 20, wherein the actuators each correspond to a surface of the second array, for rotating the surfaces about a remote pivot point to alternately cover or uncover the surfaces of the first array.

27. The apparatus of Claim 20, further comprising an optical overlayer proximate the array of active surface to direct incident light to the active surfaces.

28. An apparatus comprising:
an array of active surfaces, each having a first portion corresponding to an ON state with respect to incident visible light and a second portion corresponding to an OFF state with respect to incident visible light, the first and second portions being arrayed about a central axis; and
an array of electromechanical actuators, each corresponding to one of the active surfaces, for rotating each active surface about its respective central axis to alternately expose the first portion or the second portion to incident visible light.

29. The apparatus of Claim 28, wherein the first portion reflects a first selected color band of visible light, the active surfaces each further comprising a third portion corresponding to an ON state that reflects second color band of visible light.

30. The apparatus of Claim 28, wherein the first portion is reflective in one direction and wherein the second portion is reflective in another direction.

31. The apparatus of Claim 28, further comprising a substrate having an array of through holes, each through hole being proximate a respective active surface, the through holes being transparent to visible light, and wherein one of either the first or second portions of the active surfaces is transparent to visible light to allow the incident light to pass through the respective through hole.

32. The apparatus of Claim 28, further comprising an optical overlayer proximate the array of active surfaces to direct incident light to the active surfaces.